

## Claims

- [c1] What is claimed is:
1. A method for enabling a user to generate a schematic diagram on a computer system, the computer system comprising a display and an input device, the method comprising:
    - generating a netlist of a schematic diagram, the netlist indicating connectivity of a plurality of components through connection lines;
    - providing a normal display mode in which at least a portion of the components are presented on the display, and connection lines corresponding to the displayed components are presented on the display;
    - providing a topology display mode in which the at least a portion of the components are presented on the display without the corresponding connection lines;
    - providing a component selection function that enables a user to utilize the input device to select a particular component;
    - providing a topology editing function to modify the netlist, the topology editing function enabling the user to utilize the input device to modify the relative positioning, sizing and connectivity of a selected component, wherein the topology editing function is combinable with the topology display mode to enable the user to edit the relative positioning or sizing of the selected component without viewing the corresponding connection lines; and
    - providing automatic pin assignment and routing of the connection lines modified during the topology editing function according to the netlist;wherein the user is capable of switching between the topology display mode and the normal display mode while editing the schematic diagram.
  - [c2] 2. The method of claim 1 wherein the topology editing function changes the netlist to reflect corresponding changes made by the user to the relative positioning and connectivity of the components.
  - [c3] 3. The method of claim 2 further comprising performing the automatic pin assignment and routing at a time that is after a change is made to the netlist and before entering the normal display mode.

- [c4] 4. The method of claim 1 further comprising utilizing the netlist to classify each connection line according to a driver/load characteristic of the connection line.
- [c5] 5. The method of claim 4 further comprising providing an abstract display mode that presents on the display zero or more abstract lines for a first component, each abstract line respectively indicating connectivity of the first component with another component.
- [c6] 6. The method of claim 5 wherein each abstract line indicates a group of one or more connection lines that have common driver/load characteristics.
- [c7] 7. The method of claim 6 further comprising providing abstract information on the display for an abstract line, the abstract information indicating the number of driver connection lines and load connection lines in the group of connection lines associated with the abstract line.
- [c8] 8. The method of claim 5 wherein the first component is the user-selected component.
- [c9] 9. The method of claim 5 wherein the abstract display mode is combinable with the topology display mode.
- [c10] 10. The method of claim 4 wherein the automatic pin assignment and routing of the connection lines comprises:  
grouping together connection lines having common driver/load characteristics to form one or more routing groups;  
for each routing group, utilizing a router to generate a routing line that routes between two components; and  
splitting the routing line to provide a respective route and pin assignment for each connection line in the routing group.
- [c11] 11. The method of claim 10 wherein each connection line in each routing group shares the same driver component and the same load component.
- [c12] 12. The method of claim 10 wherein the netlist is modified to reflect the routing and pin assignment performed for each connection line.

- [c13] 13. The method of claim 1 wherein the topology editing function comprises a central template auto-arrange function that automatically arranges other components around a user-selected component according to the relative connectivity of the other components with the user-selected component.
- [c14] 14. The method of claim 1 wherein the topology editing function comprises a fan-in auto-arrange function that automatically arranges other components with respect to a user-selected component according to fan-in connectivity of the other components with the user-selected component.
- [c15] 15. The method of claim 14 wherein the user-selected component is placed in a right-most position with respect to the other components.
- [c16] 16. The method of claim 1 wherein the topology editing function comprises a fan-out auto-arrange function that automatically arranges other components with respect to a user-selected component according to fan-out connectivity of the other components with the user-selected component.
- [c17] 17. The method of claim 16 wherein the user-selected component is placed in a left-most position with respect to the other components.
- [c18] 18. The method of claim 1 wherein the topology editing function comprises a path auto-arrange function that automatically arranges user-selected components into a path structure, and arranges other components around the user-selected components according to the relative connectivity of the other components with the user-selected components.
- [c19] 19. The method of claim 1 further comprising:  
 providing a line selection function that enables the user to utilize the input device to select a particular connection line; and  
 providing a bus auto-arrange function that automatically arranges the components around a user-selected connection line according to the relative connectivity of the components with the user-selected connection line.
- [c20] 20. A computer system comprising a processor and memory, the memory holding a program adapted to perform the method of claim 1 and executable by

the processor.

- [c21] 21. A computer readable media containing data that is adapted to be extractable for providing the program of claim 20.

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